

# THE ZOOLOGIST.

THIRD SERIES

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VOL. VII.]

MAY, 1883.

[No. 77.]

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## THE INTERNATIONAL FISHERIES EXHIBITION.

THE idea of an International Fisheries Exhibition seems to have arisen out of the success which attended a similar undertaking on a smaller scale at Norwich in 1881.

Mr. Southwell was a true prophet when, describing the Norwich Exhibition in 'The Zoologist' for that year (p. 249), he said that it had proved such a success in all respects that there could be little doubt it would be speedily followed by similar exhibitions in other parts of the country. His prediction is now to be verified in the International scheme which is on the eve of completion, and which has already assumed a magnitude and importance which will eclipse everything of the kind hitherto attempted.

The inauguration has been fixed for the 12th of May, on which day the Exhibition will be opened by Her Majesty the Queen in person, and we understand that from that date the public will be afforded admission daily for six months.

Few people require to be informed, unless they be visitors from a distance, that the site of the Exhibition will be the Horticultural Gardens at South Kensington, lying between the Albert Hall, in the Knightsbridge Road, and the new Natural History Museum which faces Cromwell Road. Here a mass of temporary buildings have been erected, which, although of plain and unattractive exterior, are internally decorated with taste, and appear admirably suited to the purpose for which they have been designed. At the same time it has been wisely decided to leave untouched the most ornamental portions of the grounds, where,



during the summer months, visitors will be able to enjoy the shade of surrounding foliage, and a freshness from the neighbouring fountains, while they listen to the strains of music which will be discoursed from the two newly-decorated band-stands at opposite ends of the grounds.

Seeing the important commercial interests which are involved in all that relates to national fisheries, it is of course only natural that the enormous collection of exhibits which have been brought together at South Kensington from all quarters of the globe should be primarily of a kind to illustrate the various methods employed by different nations for capturing fish of every description available for food. Accordingly, in the scheme of classification which has been prepared, we note that the largest and most important collection of exhibits will be found in Class I., which comprehends fishing gear of all kinds, including boats, punts, trawls, dredges, nets, lines, and hooks of every description. The objects in this class have been grouped in two sections, according as they relate to "sea-fishing" or "freshwater-fishing," and will be found systematically arranged as follows:—

#### Class I.—FISHING.

##### Section I.—SEA FISHING.

1. Gear of every description and of all nations used in Trawl, Herring, Long-line, Hand-line, and every other mode or system of Fishing, including all Nets, Lines, Hooks, Harpoons, Tackle, &c., employed in the same.
2. Oyster Dredges, Crab, Lobster, Prawn, &c. Pots, and other appliances for catching fish of this description.
3. Fishing Craft of all nations; Models and Representations of the same.
  - (i.) Steam Fishing Vessels and Steam Carriers.
  - (ii.) Fishing Vessels and Boats other than Steam Vessels.
4. Ropes and Canvas suitable to Fishing Vessels.
5. Steam and Hand Capstans, Compasses, Barometers, Telescopes, Lights, Lamps, Fog-horns, Systems of Signalling at night for Fishing Fleets and Vessels, Electric Lights, Luminous Paint, and other equipment of Fishing Vessels, Charts for Fishermen.
6. Models of Harbours, Piers and Slips, for fishing purposes.
7. Fishing Tackle and Netting in different stages of preparation, and Machinery used for working up the raw material.
8. Life Boats, their equipment, and life-saving apparatus of every description.

9. Appliances and methods for breaking the force of the sea at the entrance of Harbours and elsewhere.
10. Methods of communication from the shore to Lightships and Fishing Fleets by Submarine Cables; Telephone or other means of Signalling.
11. Methods of protecting Submarine Cables from injury by Fishing Operations (illustrated by Models and Drawings).

#### Section 2.—FRESHWATER FISHING.

1. Salmon Nets and Fixed Appliances for catching Salmonidæ in all their varieties.
2. Salmon Rods, Reels, Lines, Artificial Flies and Baits, Gaffs, Spears, Creels, &c.
3. Trout Rods, Reels, Landing Nets, Lines, Artificial Flies, Baits, Baskets, Bags, &c.
4. Pike, Barbel, and other Coarse-Fish Rods, Reels and Tackle, Artificial Spinning Baits, &c.
5. Traps, Nets, Bucks, Wheels, and all kinds of apparatus for catching Eels, Lampreys, &c.
6. Hooks, &c.
7. Anglers' Apparel of every description.
8. Boats, Punts, Cobbles, collapsible, portable, &c., in models or otherwise.

Class II. relates to what may be termed the present equipment of fishermen, and in this the visitor will find not only such articles as sea-boots, wading-stockings, "guernseys," "oileys," and apparel of every description, but also models of plans of dwellings, and forms of contracts for partnerships, and insurances of boats and gear.

In Class III. we find exhibits relating to the preparation and preservation of fish, and the various modes of transport, with models of fish-curing establishments and fish-markets, thus arranged :—

#### Class III.—COMMERCIAL AND ECONOMIC.

1. Preparation, Preservation, and Utilisation of Fish, and all forms of life included in Class V.
  - (a) For edible purposes—
    - i. Models of fish-curing establishments. Methods of, and models and other representations of any appliances for, drying, curing, salting, smoking, tinning, cooking, &c.
    - ii. Fish dried, smoked, cured, salted, tinned, or otherwise prepared for food.

- iii. All products prepared from fish, such as oils, roes, isinglass, &c.
- iv. Antiseptics suitable for preserving fish for food.
- (b) For other than edible purposes—
  - i. Oils, manures, and other products prepared from fish.
  - ii. Methods of, and models and other representations of appliances for, preparing oils and manures from fish.
  - iii. Sea and fresh water pearl shells; mother-of-pearl manufactured; pearls sorted.
  - iv. Preparation and application of sponges, corals, pearls, shells, and all parts and products of aquatic animals, &c., to purposes useful and ornamental, with specimens.
- 2. Transport and Sale of Fish.
  - (a) Appliances for carrying fish and for preserving fish during transport or otherwise, and models of the same.
  - (b) Models of fish markets, and appliances connected with the same.

From an educational point of view this is a highly instructive series, and the objects comprised in the present section of this class deserve to be attentively examined.

The steps which have been recently taken by a newly-formed Association for the advancement of fish-culture in the United Kingdom will have paved the way for a thorough appreciation of the various interesting objects exhibited under the head of "Fish-culture" in Class IV. Not only members of the association referred to, but all who are interested in promoting sport for anglers, in securing an increase of food supply by cultivating the kinds of fish best suited to British waters, or in contributing to an amendment of our fishery laws, will do well to examine carefully the various models and drawings in this class, which are thus arranged:—

#### Class IV.—FISH CULTURE.

- 1. Models or Drawings of Fish Hatching, Breeding, and Rearing Establishments, including Oyster and other Shell-fish Grounds, and all Apparatus and Implements connected with the same and for transporting Fish and Fish Ova. Food for Fry.
- 2. Representations illustrative of the Development and progressive Growth of Fish.
- 3. Models and Drawings of Fish Passes and Fish Ladders.
- 4. Scientific Investigation.
  - i. Models and drawings of diseases of fish, with special reference to their origin and cure.



- ii. Processes for rendering streams polluted by sewage and chemical or other works innocuous to fish-life (illustrated by models and drawings).
  - iii. Physico-chemical investigation into those qualities of salt and fresh water which affect aquatic animals; investigation of the bottom of the sea and of lakes, shown by samples; aquatic plants in relation to fishing, &c.; researches into the aquatic fauna (animals of the several classes preserved in alcohol or prepared, &c.); apparatus and implements used in such researches.
5. Acclimatisation of Fish.

These are all very important subjects, perhaps none more so than that which relates to an investigation of the causes of disease in fish and the means of cure. For the best essay on this subject a special prize has been offered, which it is to be hoped will so far stimulate research as to lead to valuable practical results.

We need not now refer to the subjects of other essays for which prizes will be given, for under the conditions long since published by the Executive Committee all competitors are required to send in their MSS. by the 1st May. On a future occasion, should the accepted essays be printed, we may hope to refer to them in detail.

If one class of exhibits more than another can be said to have a special attraction for naturalists, it is Class V., which contains living representatives and preserved specimens of both marine and freshwater animals and plants. Specialists will find their favourite groups here represented under natural conditions, and, from the names of some of the exhibitors which have already reached us, it may be anticipated that many of the collections will be extremely good ones.

It should be observed that up to the date of penning these remarks the exhibits in this Class were not on view, nor were the arrangements for displaying them completed. Hence it has not been possible to furnish our readers, as we should like to have done, with detailed descriptions of the more interesting objects, the nature of which may be inferred from the following list:—

#### Class V.—AQUARIA.

1. Specimens, Living (Marine and Fresh Water), Fresh, Stuffed or Preserved, Casts, Drawings, and Representations of—
  - a. Algæ to be arranged under genera and species, with localities appended.
  - b. Sponges, in their natural state.

- c. Corals, in their natural state. Polypes, Jelly-fish, &c.
- d. Entozoa and Epizoa.
- e. Mollusca of all kinds and Shells not included in Class III.
- f. Star-fishes, Sea Urchins, *Holothuricæ*.
- g. Worms used for bait, or noxious; Leeches, &c.
- h. Perfect insects and larvæ of insects which are destroyers of spawn or serve as food for fish.
- i. Crustacea of all kinds.
- k. FISH OF ALL KINDS.
- l. Reptiles, such as Tortoises, Turtles, Terrapins, Lizards, Serpents, Frogs, Newts, &c.
- m. Aquatic and other birds hostile to fish or fishing.
- n. Aquatic and amphibious Mammalia (Otters, Seals, Whales, &c.), and others detrimental to fish.
- 2. Works on Ichthyology. Maps illustrating Geographical Distribution, Migration, &c., of Fishes and Spawn.
- 3. Specimens and Representations illustrative of the Relations between Extinct and Existing Fishes.

In this class we believe there will be exhibited a fine collection of sponges from Greece, and some remarkable Italian corals; while we are given to understand that both the Mollusca and Crustacea will be well represented by carefully selected and well-arranged specimens.

The Naples correspondent of the 'Daily News' informs us that one of the most notable features in this Class will be a collection of marine animals contained in 350 glass jars, and forwarded by Dr. Dohrn, Director of the Naples Zoological Station. This collection (which up to the moment of writing had not arrived) is thus described:—

"By new methods adopted in preservation the most delicate organisms are immortalised in spirit, with little or no loss of their original beauty of form. In one bottle you see a small, indistinguishable lump of animal substance, which is, or rather was, a pretty *Acyonium*, or Cork-polype: in another, the same animal fully expanded in all its delicate transparency, and covered with the little polypes that look like tiny flowers. In another receptacle you see a kind of shrunken soft tube with a few tentacles hanging out of it that look like wet feathers; it is a *Pennatula*, or Sea-feather. These and other animals are so sensitive when alive, that if the water of the tank in which they live be merely shaken, or in some cases if only a cloud darkens the light, they at once shrink up. The method adopted to

kill them while in their beautiful expanded state has been termed 'fulmination,' for it is so instantaneous that the animals have no time to draw in their tentacles.

"Among the exhibits, all of which are from the Gulf of Naples, first must be mentioned the Siphonophores, or Siphon Jelly-fish. The Siphonophore, as beautiful as fragile, is a colony composed of very differently-formed individuals. Some are polype-like feeders, who provide the nourishment; others are Medusa-like swimming-bells, and others again are real *Medusa*, which undertake the business of propagation, the whole being inseparably united. There are also specimens of Jelly-fish, which when alive pulsate their pretty bells, fringed with coloured tentacles, through the water. There are young specimens of the so-called 'Venus-girdles,' one of the free-swimming Hydrozoa. When alive, the iridescent light running in waves along the edges of these ribbon-shaped animals, caused by the rapid vibration of innumerable delicate oar-plates, is very beautiful. There are specimens of different kinds of *Salpa*, delicate creatures of a barrel-shape, which are remarkable for their curious mode of reproduction.\* Then there are Heteropods, or Keel-snails, small wonderful crystalline animals, among which the *Pterotrachea* and elegant *Carinaria* deserve special notice. Among the specimens of large mollusks are Squids, semi-transparent creatures, like winged arrows, which when alive dart to and fro with great rapidity, and are so excitable that they constantly change colour, seeming to blush rosy-red when startled. There are small Octopods, and a specimen of the very rare Paper Nautilus (*Argonauta argo*), with its transparent shell. We also find annelids, or marine worms, some with a delicate spiral crown of feathers issuing from a tube [like *Serpula vermicularis*]; others leaf-shaped, as the Planarians, which are very difficult to preserve, and the beautiful *Aphrodita aculeata*, or Sea-mouse. This does not look like a worm at all, and has its toilet carefully made before being put into spirit, for its prickly coat has been well brushed to rid it of sand and mud in order to show its beautiful metallic rainbow colours. Sea Urchins and Star-fish are not wanting, and the collection includes Sea Anemones, beautifully preserved, with all their tentacles extended. There are various species of Crustacea, including several of the *Amphipoda* (to which division belongs the well-known Sand-hopper, *Talitrus locusta*, Linn.), the transparent Pelagic Crab, *Phronima*, a finely preserved lobster with its colours quite bright, and a Mantis-shrimp, or Grasshopper-crab. Several fine kinds of Sponge; several specimens of pretty *Polysphaera*, like pieces of delicate white net; various Snails; and the remarkable *Holothuria tubulosa*, a Sea-Cucumber, with its

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\* In the genus *Salpa* the young are produced by gemmation in chains, consisting of individuals unlike the parent, and becoming oviparous, the alternate generations only being alike.—ED.

inmate the *Fierasfer acus*, a delicate little fish which lives in its body.\* There are many kinds of Mediterranean fish (including the *Argyropelecus*, or Silver-axe, a beautiful little fish in a separate bottle), but, for economy of spirit and space, only small specimens. Last come the specimens of embryo Dog Sharks, issuing from the egg with their yolk-bags attached; and there is a bottle with young true Sharks, about a foot long, nearly as useful for scientific purposes as the adult animals of ten feet long."

The Aquarium in the western corridor, illuminated by Messrs. Siemens with the electric light, will doubtless prove one of the greatest attractions to visitors. The tanks, requiring of necessity to be built very substantially, will remain permanently in position after the Exhibition is closed, and in all probability will form the finest aquarium in the metropolis. Many of the tanks are of considerable size, twenty of them holding 1600 gallons of water, and four of them 2000 gallons. Fast-swimming fishes will thus have sufficient room to display their powers of speed, while the increased transparency of the water afforded by the electric light will enable visitors to view with great clearness all the graceful movements and delicate colours of the polypes and jelly-fish.

Besides the numerous examples of living fish in the tanks, there is a very extensive collection of stuffed specimens, many of them extremely well preserved; and, as the owners in many cases have affixed to the cases particulars of weight and measurement, anglers will have an excellent opportunity of comparing notes and judging of the merits of their own trophies. In the Canadian Section, which contains a large series of stuffed fishes and aquatic birds, will be found an enormous salmon which weighed 79 lbs., exceeding by 9 lbs. the largest ever taken in the Tay. Of the Scotch monster Frank Buckland made a cast, which may be seen in his collection of models and casts at the end of the main

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\* The genus *Fierasfer* is characterised by the entire absence of the ventral fins and by having the vent under the throat. The dorsal fin extends the length of the body, and the tail, with no separate caudal fin, tapers to a point. The species referred to has the singular habit of penetrating into the respiratory cavities of the Holothurians, or Sea-Cucumbers, and also into the bodies of Star-fishes. Prof. Seeley, referring to this habit, says:—"The nature of this strange relationship between animals so unlike in their habits is at present unknown, and though the fish is probably seeking food, the instinct is so remarkable that the history of its development is looked forward to with interest."—ED.



gallery. This gallery, by the way, which faces the visitor on arriving at the principal entrance, and is devoted entirely to British exhibits, is 750 ft. in length, 50 ft. wide, and 30 ft. at its greatest height—the finest gallery in the Exhibition.

Next to Great Britain, Canada and the United States have the largest spaces allotted to them, and the collections in both these sections promise to be of an unusually interesting character. As one of the Horticultural Gardens' ponds is in the rear of the Canadian section, it is proposed to have an Indian afloat in his birch-bark canoe to show his method of paddling and steering, as well as of spearing fish; and Professor Brown Goode, one of the U. S. Fish Commissioners in charge of the American collections, has brought over a model fisherman's hut, which is to be erected in his department. Visitors will thus have presented to them, in the most realistic manner, scenes of daily life in the far North-West, and will see before them almost at a glance the fisherman's home, his boat, nets, spears, hooks, and other implements, as well as specimens of the fish captured. Sweden and Norway, to which countries a considerable space has been allotted, send similarly instructive proofs of the importance which is attached to their national fisheries.

Next to these in point of size, the area covered by Belgium and the Netherlands is pretty extensive, far exceeding that occupied by Germany, which, strange to say, is one of the smallest sections in the Exhibition. Considering the proximity of Germany to England, and the facilities for transport as compared with the carriage of collections from India, China, Japan, and Tasmania, visitors will doubtless be surprised to find Germany so inadequately represented.

The collections from China and Japan are of a very unique kind, and for many people will probably have a greater attraction than any others in the Exhibition. The models of trading-junks, fishing-boats, rafts, river-side houses, all built to scale, with model oyster-beds, stake-nets, and every kind of tackle used by Chinese and Japanese fishermen, will well repay prolonged examination. Two native artists, a carpenter and painter, who came over with the collections, have been busily employed since their arrival in decorating the building allotted to them with carvings and frescoes of native design, the effect of which is very quaint, yet quite in keeping with the character of the native collections.

We may here briefly refer to the last two classes of exhibits, namely :—

Class VI.—FISHING—FISHERY LAWS—FISH COMMERCE.

1. Ancient Fishing Implements or their Reproductions—Models—Pictures—Books—Emblems—Charters and Seals of Ancient Fishermen Guilds.
2. Fishery Laws of different Countries.
3. Copies of Treaties, Conventions, &c., dealing with International Fishery Relations.
4. Reports, Statistics and Literature of Fish, Fishing, and Fisheries.
5. Reports on Acclimatisation of Fish, and of Attempts in the Direction.

As regards the exhibits in this class we have yet to learn what facilities will be afforded for enabling visitors to derive profit from them. It is clear that one cannot peruse a charter, or code of fishery laws in the same space of time that one would look at a trawl-net, or examine a model oyster-bed, while the incessant interruption from passers-by would render any attempt at study hopeless. Unless, therefore, some provision be made in the shape of a quiet reading-room to which, under proper restrictions, maps, charts, books, or reports may be carried for reference, we do not see that the formation of this class of exhibits will lead to any useful result.

Class VII. is devoted to Loan Collections, some of which—such as Lady Brassey's Collection of Corals—are said to be quite unique of their kind.

As our object, however, is not to write a detailed catalogue of the contents of the Exhibition, but merely to direct attention to such features as are most likely to interest the readers of 'The Zoologist,' we must pass on to the Gardens, or rather to such portions of them as remain uncovered by buildings, in order to point out the animal-life which may be seen there.

The notion of exhibiting living specimens of piscivorous mammals and birds in connection with a Fisheries Exhibition shows how comprehensive has been the scheme of the Directors, which enables the public to see not only the many and varied contrivances which man has designed for fishing, but also to study the appearance and actions of some of the natural enemies of fish in the shape of Seals and Otters, Cormorants, and other waterfowl.

These will be found in the ponds of the Horticultural Gardens, where the visitor, when weary of examining the wondrous resources of art within the buildings, may turn to the contemplation of nature without, and experience a new sensation of freshness and repose.

The Exhibition, as we have said, will be opened on May 12th, and, the executive work being in the hands of a skilled and experienced staff, its success may already be safely predicted.

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### ON THE BREEDING OF THE PINE MARTEN IN CAPTIVITY.

BY A. H. COCKS, M.A., F.Z.S.

So far as I have been able to ascertain, there is no instance recorded of the Pine Marten (or other species of the genus) breeding in captivity; and but little appears to be known concerning its reproduction in the wild state, for in no book that I have met with is mention made of the remarkable difference in the colour of the young when first born, which surely would have been noticed had the fact been known.

An adult female Pine Marten sent to me from Cumberland in May, 1876, had for the last two, if not three, years shared a cage with a male of the same species, without showing any signs of breeding, until at about 11 p.m. on April 7, 1882, I heard the unmistakable whimpering, or squealing, of young ones proceeding from one of the bed-boxes in this cage; I had fed the Martens about six o'clock, and feel certain that no young were then born. I at once shut off the male animal, not knowing how he might treat the youngsters. On the morning of the 10th I ventured to take out one of the young. It was about six inches long, including the tail, which was about, or nearly,  $1\frac{3}{4}$  inches long, and appeared out of all proportion in so young an animal, and was in shape, and, in proportion to the head and body, like that member in an adult Stoat. It will, I believe, be a surprise to others, as it certainly was to me, to learn that this species is at first quite *white*; the coat being, of course, fine and short.

On the 14th I again looked at the young, and found them to be three in number—two males and one female. They were now getting grizzled, like very young Polecat Ferrets; coats

longer and rougher than before, and bodies heavier and stouter, but not perceptibly longer than on the 10th. Certainly if I had met with these cubs without knowing their parentage I should not have guessed them to be Pine Martens; but should have been inclined to suppose they were young Polecat Ferrets, or, perhaps, chiefly in consideration of their tails, young Stoats, with the young of which species I am unacquainted.

On the 18th the cubs were shifted by their mother to the other bed-box, probably in consequence of my having disturbed them; I was obliged also to go into the cage at least once a day to attend to the male, which I had shut into a smaller cage enclosed in the other, and also to two other Martens in a cage beyond, to which the only access was through the cage tenanted by the nursery party. The mother is an exceptionally shy specimen, and these constant visits, and also, perhaps, the close proximity of the other Martens, kept her in a restless state, and on the evening of the 22nd I saw her with one of the cubs in her mouth; and on May 3rd, on going into the cage to clean it out, I found one of the young ones lying almost dead on the top of one of the bed-boxes, where it must have been carried and left by the mother. I took it indoors immediately, and carefully warmed it; but it was too much exhausted to swallow milk, and died an hour and a half later. I have preserved it in spirit; it was a male, length  $10\frac{3}{8}$  inches.\* The following evening I put some fresh straw into the cage, which had the effect of frightening the Marten; and, taking one of the cubs out of the box in which it was, she carried it behind a box out of sight, and presently let it fall on to the ground, a drop of about five feet. However, no bones were broken, and I replaced it in the box with the other cub, and fortunately had no further disaster. The eyes were still closed. I left home the next day (the 5th) for a fortnight, during which interval they acquired the use of their eyes.

On the 25th one of the cubs showed itself for the first time, trying to climb out of the bed-box, and calling loudly.

On the 29th the mother took three young Greenfinches which I gave her, and tried to induce the young to eat, uttering a peculiar chuckling or clucking noise. The cubs made repeated efforts to get out of the box, with a view of finding a place where

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\* Nose to eye-slit,  $\frac{3}{4}$  inch. Eye-slit to ear,  $\frac{3}{8}$ . Head, 2. Neck and body,  $5\frac{3}{4}$ . Tail,  $2\frac{1}{2}$ .



they could eat by themselves, but were each time pulled back by the mother. One cub, however, at length succeeded in getting out, and ate and growled in a most satisfactory manner. The next day the cubs had a scrimmage over eating a Sparrow, and one or both came out.

On June 5th, one of the cubs being out, scrambled back into the box, which is rather more than a foot high, by helping itself up by the wall, which formed an angle with the side of the box, and by the next day was able to *jump* on to the top of the box.

On the 23rd they made, I believe, their first descent to the ground—having been born at a height of nearly five feet above it—by means of a carefully-arranged inclined plane, or “chicken-ladder.” I first actually saw them do so on the evening of the 25th.

On July 2nd, being the anniversary of the date on which I had measured the young Marten the previous year (*cf.* ‘Zoologist,’ 1881, p. 333), I endeavoured to measure the young male, but it proved so extremely fractious, that I could not succeed in measuring it even as accurately as on that occasion. It was, however, just about the same size, or if anything slightly larger, than those cubs at that date; I therefore think my estimate of the age of the former couple was pretty correct, as the fact of having been taken from their mother when quite small, and possibly not very suitably fed by the shepherd before they were sent to me, and then the journey, would be likely to throw them back somewhat, and slightly retard their growth.

The young Martens were quite full grown by the autumn, and are still flourishing; I regret that I am unable to state the length of gestation, but may hope for “better luck” if there should be a “next time.”

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## ON THE TREATMENT OF SNAKES IN CAPTIVITY.

BY ARTHUR STRADLING, C.M.Z.S.

(Continued from p. 114.)

HAVING given an outline of three different styles of cage, leaving all possible amplifications and modifications to the taste and discretion of the amateur, we may now inquire what serpents are to be selected for confinement in each, where they are to be got, and how to get them.

Nothing is easier than to draw up a list of a hundred reptiles, "highly commended" for the purpose; few things would be more difficult than to obtain them. Obviously, every snake on earth might be allotted as "suitable" to one or another of these three cages, but, with the exception of a few species, the number that reach our national menageries, let alone the vivaria of private collectors, is incredibly small. Dr. Günther classifies about four hundred species, including many varieties, of colubrine snakes alone. Not above one-fifth of these have been seen alive at our own Zoological Gardens—the best-stocked reptilium in Europe—and not more than one-twentieth at any one time; while of the majority of specimens composing this inconsiderable section it may be said that the offer of a hundred guineas might not produce another in ten years. Yet many of these are far more plentiful in the countries they inhabit than grass-snakes are with us, and the same obstacles to capture and transmission cannot be alleged against them that exist in the case of fish or insects. No doubt many that are taken uninjured do die from cruelties inflicted on them or want of care in transport; but beyond this and the horror with which the tribe in general is regarded in all countries, there seems to be an amount of selective and individual prejudice, which it is to be hoped that a more widely-diffused recognition of vulgar errors, as the progress of ophiology reveals their nature, will subdue. Snake-catchers in India will bring in cobras and pythons; the Cingalhesse rat-snakes; and the Indians of Brazil net and lasso boas, anacondas, and rattlesnakes without hesitation, but the hundreds of other serpents, venomous and innocent, which are found in these lands, and for which the dusky trappers would receive a better price, seem to be protected by some atmosphere of special mysterious dread which surrounds them. The so-called two-headed snakes—in reality harmless amphisbœnas—which are as common as earthworms in nearly every tropical and subtropical part of the globe, and of which there are numerous varieties, either inspire so much terror, or are so entirely disregarded, that they are scarcely known in zoological gardens, and are comparatively rare even in museums.

Therefore, although I am about to append a list, the essential part of my advice to the reader on this head must be, Take whatever you can get, and be thankful! I know from experience that one may live long in a country, and have many agents professedly

on the *qui vive*, without being able to obtain particular reptiles, and that the maxim is not without force of application however one may be situated. Even in this enlightened land it is generally easier to go and catch an adder than to find an opportunity of purchasing one ready caught; here, however, imported produce is perhaps more abundant than home material.

The names subjoined are those of snakes which the student will be able to buy sometimes from dealers and menageries on the Continent (rarely here, with the exception of one or two species), more probably than other kinds; or which may be procured for him by friends in the several parts of the world indicated, where the species mentioned are those to be met with most frequently. As a possible assistance in the quest, I give local or vernacular names when I know them, though, as was said in the first chapter, they are of little value; the authors whose nomenclature is quoted will supply descriptions. The collector may feel assured that he will at all times be able to procure *some* that are contained within this category, and that any one of them may come under his notice, if he prosecutes his inquiries in the right directions, at any time. But, bearing in mind the impediments that are detailed above, he will scarcely hope ever to possess all of them; still less would he exclude any not herein set down which might present themselves to him.

The owner of the large heated den, of which we first discoursed, will naturally look out for reptiles befitting its magnificent proportions—though small ones would by no means complain of extra-spacious accommodation. The greater constrictors—the boa, python, and anaconda—suggest themselves; serpents which are fortunately not only tolerably easy to obtain, but which do fairly well in confinement, and evince a higher degree of intelligence, viewed in the light of pets, than most reptiles, being in this respect amongst snakes what the dog, the horse, and the elephant are amongst mammals. Of these the cheapest, hardiest, and most readily procured is the West African Python (*Python sebae*), sometimes called the African Boa. (For the genus and species of these very common snakes I need give no authority, since they will be found in all books at the head of the synonymy.) Almost all dealers in animals keep this article “in stock”; Cross of Liverpool, Jamrach, and others supply small specimens, four or five feet long, for twenty-five or thirty

shillings apiece. Above that length the price increases at the rate of about one pound per foot. These are the snakes almost invariably exhibited by itinerant *dompteurs* at continental fairs, and in travelling vans and menageries. They seem, more than any others, to be exported in large quantities from their habitat, and many of the European Zoological Gardens contain a great number; in that at Antwerp they comprise nine-tenths of the occupants of the Reptilium, some being very fine examples. Fresh supplies are constantly arriving, the surplus being weeded out every now and then and sold by auction. A lot of young ones were born there some years ago; I bought five of them, and found them to get on remarkably well, except one which died of a tumour in the head when it had grown to a length of about eight feet. They usually become very tame, with proper treatment, and feed voraciously; and will endure a lower temperature and show more activity than any other serpent of this class. The thickest (though not the longest) snake at Regent's Park is a West African Python, not taking into account a fictitious girth which it owes to an internal rupture at one part; it is about fourteen feet in length, and has been there nineteen years. Specimens are still alive elsewhere which have been in confinement over twenty years.

The Indian Python, or Rock-snake (*Python molurus*), is another hardy reptile frequently offered for sale, but is not to be purchased so cheaply as the other, and is frequently persistently savage; Jamrach receives large consignments of this species. Both these snakes have been known to incubate in our London Zoological Gardens. There are several other Pythons more rarely met with; a most eligible species is the Royal Python (*P. regius*), a quiet and docile creature, which, from the habit it displays of lying *folded up*, so to speak, has acquired the name of "ball-snake." Several ladies of my acquaintance keep pet specimens of the Royal Python—which I have known a dealer to sell as the commoner West African variety. Snake-vendors are not as a rule deeply versed in nice herpetological distinctions; and since *caveat emptor* is their unvarying motto, it is only just that the balance should occasionally come out in favour of that personage. The Reticulated Python (*P. reticulatus*) of Borneo and other parts of the East, is a valuable and delicate species; two hundred guineas have been offered for the large one at the



Zoo, which is twenty-five feet long and weighs over sixteen stone.

The common Boa (*Boa constrictor*), inhabiting South and Central America and the West India Islands, is the next most available subject to become a denizen of our big cage. Its beauty of hue and pattern, which impelled Laurenti to name it *Constrictor formosissimus*, far exceeds that of the last genus, but it is not so hardy. It is readily tamed, those of a light ground-colour being generally quieter than those which exhibit a deeper red, while the latter perhaps feed better; among all kinds of snakes different idiosyncracies of temper are shewn by individuals, whatever the prevailing characteristics of the race may be. The Boa is viviparous, and has bred in captivity more than once; several of the celebrated brood of June 30th, 1877, at the Zoological Gardens fell to my share. One only survives at the present time; she is as tractable and inoffensive as the guinea-pigs and rabbits upon which she feeds, and is so free from nervousness that a child might play with her—and does, very often. Boas and Pythons are both liable to tumours, which will be described in a subsequent chapter among the other diseases incidental to ophidian flesh. Common Boas are sometimes advertised for sale under the title of Harlequin Snakes; if purchased at a naturalist's emporium they will cost from two to ten pounds each, according to the size, but the people who bring them home to sell do not receive a fifth of that price for them from the directors of menageries. They may be bought in the market-places of most of the cities on the sea-coast of South America, secured in wicker baskets; ranging between half a yard and twelve or fifteen feet, and priced accordingly (when the demand has been gradually and vociferously reduced from its original exorbitance to the lowest point) from two shillings to twenty. *Jiboya* is the native name. A poor starved little Ribbon, bought in Pernambuco when it was not much over a foot in length, now measures nearly five, and is as thick as my arm.

The Peruvian and King Boas (*Boa eques* and *imperator*) and three Tree Boas (*Corallus hortulanus*, *Epicrates cenchris*, and *Epicrates angulifer*), all hailing from tropical regions in the New World, are rare, but are now and then met with as "dark varieties" in the lists of dealers, or in the hands of those who catch them. The Madagascar Boa (*Pelophilus madagascariensis*,

Duméril and Bibron), fierce but handsome, is rarer still. The Jamaica Boa or Yellow Snake, *Chilobothrus inornatus* (Reinhardt), is common enough in that island, and tolerably well represented in collections; at Regent's Park it has been bred, and has crossed with the Pale-headed Tree Boa. It grows to no great size, and is a spiteful brute, but it will usually feed and thrive.

Thirdly, we have the Anaconda or Water Boa (*Eunectes murinus*), also a native of tropical America; it is known as *kamudi* in Guiana and *succurhuba* in Brazil. Since specimens have been killed which have been measured between thirty and forty feet in length, it seems probable that this constrictor attains a larger size than any other member of the serpent tribe. Its partiality for water is well known, and in confinement it will be found to lie in the tank more than half the time; when out of the water it is generally very restless. Although extremely savage when first caught, it soon becomes tame in the majority of instances, and has been known to evince marked discriminative affection towards particular people; tolerably hardy, though of capricious appetite, and bearing captivity well, it is a grand creature, with its glittering golden scales relieved by circular black spots, and is possessed of immense strength. This is the snake to ferret out all the chinks and spaces into which it can shove its blunt nose, and to test the weak places in a cage. When it is at home it costs rather more than its near relative the Boa, and the price would, I should think, bear a somewhat proportionate increase on this side of the Atlantic. A large Anaconda has been kept at the Zoo for eighteen years, and is in good health at the present time.

Still, snakes are luxuries for which there is no great demand, and those who have them for sale are as a rule very glad to get rid of them, whatever the species may be, for a reasonable sum—something under a five-pound note—unless the size renders them of additional market value as objects of curiosity for exhibitions. There is no definite tariff for rarity, nor indeed is it taken much into account; and the price of *any* snake under six feet will not be ruinous. With these constrictors, as among rapacious birds, the female is rather larger than the male. No difference in coloration between the sexes which can be reduced to any law has been observed, even in the most variable species, but the

male serpent can always be distinguished by the presence of two hooks upon the under surface, a cast of which is visible in the slough.

Many of the Australian snakes are of especial interest, but unhappily very few reach our shores alive, owing to the protracted voyage. Two members of the *Boidæ* belonging to that country would be eminently suitable for the cage we are considering—the Diamond Snake (*Morelia spilotes*, Lacépède), and the Carpet Snake (*Morelia variegata*, Gray). Certain large Colubers would appear to advantage there, too, notably the so-called Rat-snakes from Ceylon or India and South America, which grow to ten or twelve feet, but are much more slender than pythonoid serpents of a corresponding length. They eat frogs, small rats, and birds. The former (*Coryphodon blumenbachii*, Duméril and Bibron), of a silver or pale olive colour, is the easier to tame; the South American one (*Spilotes variabilis*, Wagler), also called the Wasp-snake, presents a shining black, barred with yellow, the two colours varying enormously in their proportion and arrangement in different individuals, and is a pretty and curious reptile. Neither is uncommon, the Ceylon variety, however, being brought to Europe in much the greater quantity; I was once offered over a dozen for five shillings apiece by an English dealer, who had received a large box full in the depth of winter. Both have singularly flattened necks, and the South American species produces a rattling noise by quivering its tail upon the ground when it is excited. The bite of these Rat-snakes is insignificant compared to that of constrictors of an equal length, since their mouths are so much smaller; but the *Boidæ* are more to be recommended to the amateur, as feeding better, healthier, more docile, and displaying a higher degree of character.

For the smaller heated cage, with the reservoir underneath, it may be said that any snake of a size proportionate to its dimensions is suitable to it, since none of those which inhabit the higher latitudes and thrive in a temperate climate object to a little more warmth. All those, therefore, which are mentioned in the third class may be considered applicable to this as well; some, too, which get through the hottest summer months here comfortably enough without artificial increase of temperature will require to be kept in such a cage during the rest of the year; some need a little extra heat to induce them to feed; while it is

obvious that the cage may be used instead of the third for hardy snakes without any hot water at all, or that this may be supplied only when the thermometer indicates its necessity. It must be remembered, however, that the species which demand heat demand it constantly; and that although the degree may somewhat vary, it will not do to keep them before the fire all day and simply cover them up at night. An incomplete arrangement of this sort generally results in their being kept in darkness a great portion of their time, which is not only bad for their health, but makes them wild and nervous when disturbed.

Small specimens of all those named above will do very well for cage number two, with plate-glass for constrictors. There are two of the constrictive colubrine serpents which, though they grow to six feet or more, are most frequently met with of a length which adapts them to this place of confinement; the Four-rayed Snake (*Elaphis quater-radiatus*, Duméril and Bibron), largest of European ophidians, common in Dalmatia, but occurring in most of the countries bordering the Mediterranean, a very pretty and gentle creature; and the Robben Island Snake (*Coronella phocorum*, Günther), from South Africa, plentiful enough in its native isle, but much more difficult to obtain here than the Four-rayed. It is of a glowing, burnished dark-brown colour—almost black, in fact; always ready to attack, and rarely tamed; and with such a voracious appetite that it ought always to be separated from its fellows at feeding-time, as it will hold the animal it has just killed in its coils while it endeavours to despoil the other snakes of their prey.

Whip and other tree-snakes have already been suggested, in connection with a plant. Curious and beautiful reptiles, they are very delicate and capricious in diet, but have great tenacity of life under abstinence. The brilliant-green *Philodryas viridissimus* (Wagler) of South America, the Carolina Coach-whip Snake (*Herpetodryas flagelliformis*, Catesby), and various members of the genera *Dendrophis*, *Ahaetulla*, *Langaha*, *Dryiophis*, and *Passerita* may occasionally be procured, but are all rare. Much the same must be said of many of those exquisite, vivid-hued serpents which often literally swarm in their habitat, and which are almost always lumped collectively together as "coral" snakes in local nomenclature; the blood-red *Scytale coronatum* (Dum. and Bibr.), the scarlet and black *Erythrolamprus venustissimus*



(Boie), and the symmetrically-patterned yellow, vermilion, black and white species of *Oxyrhopus*—*formosus*, *doliatus*, *petolaris*, and *trigeminus* (Wagler). The Bead Snake (*Simotes coccineus*, Latreille), which Audubon calls the Harlequin, and which is common in North Carolina and other parts of America; *Leptodeira annulata* (Shaw), from the Isthmus of Panama; *Leptodeira rufescens* (Fitzinger), the absurdly-maligned "night-adder" of the Cape of Good Hope; and *Carphophis amœna* (Dum. and Bibr.), the Crimson-bellied Snake of Pennsylvania—all exhibiting more or less gorgeous coloration, may not improbably come in our way, and can be kept alive with little trouble. There is another reptile which will get on very well in a case of this description, either alone or with serpents; for, though named the Glass Snake, it does not belong to the Ophidia at all, being in reality a legless lizard like the slow-worm. It ranks among the *Zonuridæ* family, and is classified by Oppel as *Pseudopus pallasi*. Found in Dalmatia and other parts of Southern Europe, it can frequently be bought in this country, and most collections of living animals are likely to have duplicates for exchange. It is a singular and inoffensive creature, easily fed on dead mice, slugs and snails, and owes its designation to the extreme brittleness of its thick, ribbed body. One died recently at the Zoological Gardens which had been kept there nearly twenty years.

#### NOTES AND OBSERVATIONS ON BRITISH STALK-EYED CRUSTACEA.

BY JOHN T. CARRINGTON, F.L.S., AND EDWARD LOVETT.

(Continued from p. 72.)

##### *Galathea nexa*, Emb.

This species, as stated by Prof. Bell, partakes of some of the characteristics of *G. squamifera* and *G. strigosa*, for it resembles the former in the absence of spines in the hand, and the latter in the comparative length of the external pedipalps. Its cephalothorax is somewhat oval in shape, and broader than the abdominal somites. The anterior pair of legs are very hairy, and the remaining ones armed with sharp-pointed claws. Its colour is brown.

*Galathea nexa* is a deep-water species, and is by no means common. It has been obtained from the coast of Down and Antrim; from Loch Fyne; and by Prof. Forbes from Zetland; also from Cornwall, in forty fathoms.

*Galathea intermedia*, Kroyer.

This species somewhat resembles the young form of *Galathea squamifera*, except that its colour is a pale yellowish red. The carapace, too, is more level on the lateral margin and also more spinous. The first pair of legs are proportionately large and nearly equal in width their whole length.

There appears to be some difficulty in determining the genus *Galathea*, for in the 'Transactions' of the Tyneside Naturalists' Club, 1863-4, p. 184, this species is stated to be *G. intermedia*, and again *G. intermedia* has been called, and is, we believe, considered to be identical with, *G. andrewsii*.

As however we have not had an opportunity of seeing this species, we are unable to offer a decided opinion upon it.

We should not consider it by any means rare, for it is recorded (under various names) from Shetland, St. Andrews, Dublin, Belfast, Berwick, Plymouth, and Cornwall.

*Galathea dispersa*, Bate.

This species, which is mentioned in the British Association Report, 1868, p. 265, as common in the seas surrounding the Shetlands, appears to occur also in the Channel.

It much resembles the foregoing species; the hands are narrow and ovate, the fingers meeting along their inner margins.

Amongst a large number obtained by us from the Channel, we noticed several beautifully-marked varieties having a white medial band, with a lateral one across the thorax, in some instances forming a cross.

*Munida bamfficus*, Penn.

This remarkable species differs considerably from *Galathea*, and in some points is more closely allied to the true lobster form.

Its carapace is transversely ribbed with short hairy ridges,

terminating at the lateral margins in small spines; the rostrum is composed of a long straight spine, flanked by two smaller ones, which form the protection to the eye. The anterior pair of legs are very long, somewhat narrow, and nearly of the same width throughout; the first joint is armed with spines at the end, and the whole of the joints are hairy and slightly spinous. The remaining legs are long and slender, the terminal claw not being so sharp as in the foregoing species. The abdominal segments are convex, more so than in the case of *Galathea*, and the colour is a dull reddish tint, more or less marked with a brighter red. This species is about two and a half to three inches in length, but, as its anterior legs are about twice this length, it gives the animal a larger appearance.

*Munida banfficus* appears to be a very decided deep-water species, and hence is looked upon as rare. It has been obtained from Plymouth Sound, Falmouth, Zetland, Banffshire, and Ireland, from stomachs of cod, as also from the Mull of Galloway, where it was "dredged alive in water from one hundred and ten to one hundred and forty fathoms in depth."

*Scyllarus arctus.*

This rare species is a recent addition to the British Crustacea, not being mentioned in Bell's work. It will be found figured in 'The Zoologist,' 1879, p. 473. It is a stout, thick-set animal, possessing no enlarged and heavy forceps, as in the case of its allies, but simply short and comparatively slender pincers; the remainder of the legs are short, stout, and armed with sharply-pointed terminal joints.

The antennal scale is much enlarged, and is a prominent feature in this species; the antennæ are short, and the eyes stout and club-shaped.

The thoracic and abdominal segments are strongly arched, about the same width throughout, except towards the last two segments, where they are narrower; the thorax is spinous, the points being chiefly confined to a central and two lateral ridges, and directed forwards.

The colour of *Scyllarus arctus* is a rich reddish brown, and the length is about six inches. It is a rare species in our seas, but has been taken off the Devon and Cornish coasts, and we have

obtained several from the Channel Islands. The ova are of a very brilliant red, and are mature about May. It is popularly known as the "Broad-nosed Lobster."

*Palinurus vulgaris*, Latr.

This boldly characterised crustacean is also an important one, constituting as it does an article of food of considerable value, and therefore being the subject of a branch of fishing industry of no mean proportions.

Its chief feature is the dense mass of variously-sized spines with which its carapace is covered; these spines point forwards, and the eyes and other delicate parts are protected by them in a very marked manner. The rostrum is strongly spinous, and the basal joints of the antennæ are similarly clothed. The antennæ themselves are extremely long; they are segmented, and the border of each segment is fringed with setæ. The eyes are kidney-shaped and large. The anterior pair of legs are larger in the male than in the female, but they do not attain to the comparative bulk usually reached by the Crustacea generally; the forceps are imperfect, the inner one being simply represented by a spine; the remaining legs are strong, smooth, and armed with a hooked terminal joint, on which are a few tufts of setæ. The abdominal somites are smooth, arched, and terminating at the lateral edges in a triangular form.

The swimmerets are absent on the first abdominal somite; on the rest they are very remarkable, being fleshy and more like membranaceous plates than the plumose pseudo-feet of most other Crustacea. The ova are of great interest, presenting as they do a curious anomaly, which is their small size as compared with the size of the animal; in fact, the eggs of this species are actually smaller than the eggs of *Axius stirynchus*, although the latter animal is barely larger than one of the first legs of *Palinurus vulgaris*. This remarkable discrepancy in proportionate sizes of ova does not appear easy of explanation. There are few species whose ova serve to illustrate the interesting features of crustacean embryology better than this, when examined microscopically; the ligatures by which each ovum is connected to the main egg-stalk, and the developed zoea folded with its large tail curved round till it covers the cephalo-thorax, are all beautifully shown as the eggs approach maturity.



The colour of *Palinurus vulgaris* is reddish brown, with purple shades and white markings, although varieties frequently occur, a fine one in Mr. Carrington's collection being, when alive, of a brilliant tint almost approaching blood-red, and this colour has altered but very slightly in preserving the animal.

This species often reaches a length of fifteen or eighteen inches exclusive of the antennæ; it is abundant on our southern and western shores, but is not common in the north.

*Palinurus vulgaris* is a favourite specimen for marine aquaria; hence it is somewhat better known than many of our other Crustacea, and many very interesting points in its habits have been observed, not the least being the shedding or casting of its exo-skeleton during growth: this is done so thoroughly and completely that the skin of even the eyes and mouth-organs are shed with the rest, and it is possible to obtain a cast skin as perfect in external detail as the animal itself.

#### THALASSINIDÆ, Bell.

The members of this curious family are chiefly characterised by their remarkable habit of boring. Their burrows, which are made in mud, clay, or detritus, are often of great length, and the process of digging for them is a most difficult and tedious one, on account of the tortuous and meandering windings of these passages. The genera of this family are of the lobster form, but slender in structure, the primary legs being heavy and massive, and adapted for burrowing purposes.

#### *Callianassa subterranea*, Leach.

This remarkable crustacean has the thoracic carapace arched and quite smooth, the abdominal segments being also smooth, but flattened and somewhat soft. The eyes are very small, and the antennæ are about one-third the length of the animal. The first pair of legs are very unequal in size, but not constant, sometimes the left, sometimes the right, being the larger. This big claw is smooth, massive, and armed with powerful forceps, which are fringed with cilia on the inner edge; the arm being furnished with a large spine curved forwards. The small claw is very simple in structure, and terminates in a small forceps. The second pair of legs have the terminal joint enlarged and furnished

with a pincer. The swimming-feet are plumose, and the tail consists of a telson and four plates fringed with cilia. The colour of this species is of a beautiful pink, and its length is from two to three inches exclusive of claw.

*Callianassa subterranea*, as its specific name implies, lives in burrows or subterranean passages; we have obtained it from such positions in the felspathic clay on the shores of Jersey in considerable numbers. Its ova are large and few in number, and it would appear as if this was a rule with those Crustacea whose habits are fossorial, and who are not thereby subject to the exterminating influences that others are; the eggs are hatched in September and October. Besides Jersey, this species is recorded from the Devon coast, from the coast of Down, Ireland, as well as from Cornwall (probably Polperro), and the Moray Firth.

*Gebia stellata*, Leach.

This species we have not yet seen; it is, however, described by Prof. Bell, who says that the gastric region of the carapace is hairy and sharply scabrous, the rostrum small and acute, and the external antennæ with the setæ about the length of the body. The anterior pair of legs have the arm elongated and slightly curved, with a small tooth near the extremity; wrist armed with a sharp spine; the second to fifth pair of legs gradually becoming more slender. The abdominal somites are broader in the middle than at the extremities, the swimmerets are plumose, and the tail-plates short and broad, being, like all the legs, fringed with cilia. Length about an inch and a half.

This species is said to have been discovered by Mr. Gibbs in the Kingsbridge Estuary, and Leach states that "it has been taken on some of the shores of Plymouth Sound, under the mud, in which it makes long winding horizontal passages, often of a hundred feet or more in length." It has also been recorded from the Moray Firth.

(To be continued.)

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## NOTES AND QUERIES.

**The Birds of Walney Island.**—Under this title Mr. W. A. Durnford has published a pamphlet of twenty pages (to be had of R. Griffiths, Church Street, Barnsley), in which a list of 188 species is given. This number strikes us at once as being remarkable; but on reading the Introduction we perceive that the writer has “attempted to embrace every species which, to the best of his belief, has occurred within thirty or forty miles of the borough of Barrow-in-Furness, (of which Walney forms a part), so that within these limits he includes a large portion of the Lake district, embracing parts of West Cumberland and Westmoreland, as well as North Lancashire.” Under these circumstances it would have been better to have selected a more comprehensive title. Amongst the more remarkable species we find the Spotted Eagle, a specimen of which, picked up dead on the west shore of Walney in 1875, was examined by Mr. Durnford, who states that “not having been able to ascertain any other circumstances in connection with its occurrence, he does not feel justified in adding it to the list of British-killed specimens.” Yet, somewhat inconsistently, he introduces it all the same into his list. Such rarities, also, as the Goshawk, Swallow-tailed Kite, Crested Tit, and some others, are included, on what appears to be rather slender evidence. Mr. Durnford, however, states in his Introduction that his list is subject to correction, which he will be glad to receive, and which may be addressed to him at Tankersley Rectory, near Barnsley.

**Animal Parasites.**—Under the name of “tick” two quite distinct animal forms are often confounded. The sheep-tick or louse, as shepherds call it, found at the roots of the wool on sheep, and which I have often formerly had brought to me under one of those names, is an aberrant form of *Hippobosca*, a genus of dipterous insects, the typical species being the well-known forest-fly. An excellent figure of the sheep-tick will be found in Curtis’s ‘British Entomology,’ pl. 142, under the name of *Melophagus ovinus*. *Ixodes* is a genus of the *Acarida*, a group easily distinguished from the true insects by their having eight legs in the adult state. Six British species of *Ixodes* are described by Dr. Leach in vol. xi. of the Linnean ‘Transactions.’ There are probably others not as yet determined. The one best known is the common dog-tick, found in a free state in woods and plantations, and attaching itself not merely to dogs, but to hares, &c., and especially to hedgehogs, which often abound with them, the ticks getting their hold as the animals pass through the close grass. After attachment they soon get gorged with blood, their abdomens swelling to an immense size compared with the insignificant appearance of them previous to attachment. But I can remember no instance of an *Ixodes* found on a

sheep, though I would not undertake to say they never occur on that animal.—L. BLOMEFIELD (Bath).—From *Nature*.

[Our readers may not all be aware that under the signature "L. Blomefield" they have a communication from a very well-known zoologist. The Rev. Leonard Jenyns, with whose excellent 'Manual of British Vertebrates,' published in 1835, we are all familiar, some years since changed his name to Blomefield, and went to reside at Bath, where we are happy to hear he is still living in good health, and taking almost as keen an interest as ever in Natural History.—ED.]

#### MAMMALIA.

**A Pied Shrew.**—On March 21st I caught a pied example of the common Shrew (*Sorex araneus*, Linn.). It is a small specimen, having part of the head and body of the normal colour, but that of the latter interrupted by a white band, which encircles nearly the whole of the body at the loins, being widest below, and extending over about half the surface of the abdomen, where it takes an irregular form, the edges, however, being everywhere sharply defined. There is in addition to this a patch on one side of the head and neck, of silvery or hoary grey, shaded off gradually into the hue of the surrounding parts, and apparently occasioned by the occurrence of white or whitish hairs among those of the legitimate colour.—G. T. ROPE (Blaxhall, Wickham Market).

#### BIRDS.

**Notes on Ornithology from Devonshire.**—An immature specimen of the Pomatorhine Skua was shot on the Exe in November last. At the same time a flock of Brent Geese visited the estuary of the Exe, and some were killed. Hardly anything of interest occurred in this neighbourhood during the winter, birds of all kinds being remarkably scarce. Very few Redwings have been seen, and I have not noticed a single Fieldfare, though a friend saw two or three. A fine adult Great Black-backed Gull was shot on the Exe at the beginning of February. Sparrows were building on the 10th of that month, and several Rooks' nests were partially built in the close of Exeter Cathedral, and by the 22nd a good many more nests were built there, but elsewhere Rooks had not commenced to build before the 24th. On the 28th a Bittern was shot at the mouth of the River Clyst, four miles from Exeter. On the 10th March a Black-headed Gull in full summer plumage was killed at Cullumpton. A few individuals of this species may be seen throughout the autumn, winter, and spring on the river at Exeter Quay. The adults have remained here till within the last few days (8th April), and there are still some immature birds of last year to be seen. They appear to remain much later here than at



Plymouth. On the 18th March, returning from a long country walk without having seen anything worth noticing, as I passed over the bridge near the Custom House on Exeter Quay, a bird suddenly appeared before me, which I at once perceived was something I had never seen before. It was rather tame, but very restless, and evidently a stranger, creeping along at the base of the walls of the goods sheds, where it attracted the attention of some Sparrows, who mobbed it. It was a Pipit, having a grey head and back; white throat, breast, and belly, slightly tinged with buff on the sides of the neck, and the outer tail-feathers were pure white. It opened and shut its tail, displaying the white feathers. I think there is little doubt but that it was a Water Pipit (*Anthus spipoletta*) in full breeding plumage. It was very like the figures in Professor Newton's edition of Yarrell's 'British Birds.' I went to look for it several times subsequently, but could not see it again. Specimens of Pipits killed at Beer in February last have been sent me as Water Pipits, but they appear to be the variety of the Rock Pipit called *Anthus rupestris*, Nilsson. On the 23rd (Good Friday) I saw a male Continental White Wagtail near Exeter. I am pretty sure this species breeds annually in a pigeon-hole in a stable wall about three miles from Exeter. On the 25th (Easter Day) I observed one Chiffchaff, evidently just arrived, being very tame, allowing me to approach it within a foot or two. I saw no others then nor any since. On the 28th a very remarkable variety of the Nuthatch was shot within the city limits of Exeter. There is no white on the lower parts, which are dark-lead colour. The head is much darker than usual, and the black line through the eye is broader. The rufous patch over the thigh is rather larger and deeper in colour. There is only a very slightly light-coloured patch on the side of the neck. About this time a Guillemot, still in winter plumage, was picked up dead on the coast, evidently starved to death; and another Greater Black-backed Gull was obtained on the river. On the 29th a male Ring Ouzel was shot at Alphington, close to Exeter, being the first I have ever heard of occurring in the spring in this neighbourhood, though it has been seen at Exmouth, and in other places around Exeter, in autumn, and is numerous on the Tors of Dartmoor. A Rough-legged Buzzard was killed near Lustleigh, Dartmoor, on the 28th March. Hedgesparrows and Starlings were building on the 2nd April.—W. S. M. D'URBAN (Albert Memorial Museum, Exeter).

**Heronries in Somersetshire.**—When out hunting with the Taunton Vale Hounds last year, 1882, as we were running through the coverts at Halsewell on the 3rd of April, several Herons rose from some fir trees in the woods. I counted ten then, and there were several others on the trees, which kept up a constant croaking at the hounds as they were running past. I did not then know of the existence of a herony at Halsewell, so was surprised to see so many Herons on the trees, evidently building or

repairing old nests. The hounds were then running, and I had not much time to look at them, hoping to pay another visit to the spot soon afterwards, but I was unluckily prevented from doing so. There was no one out then who could give me any information about the heronry, which I supposed existed there. This year we were at the same place on the 6th of April drawing the woods for a fox, when I again saw the Herons, and I had more time to have a good look at them. There were five or six pairs flying round over the trees and wheeling about, and a good many more never rose from their nests, but made a loud croaking at the hounds whenever one passed under a tree on which there was a nest. A farmer who was out, and who rents the adjoining land, told me that so long as he could remember there had always been a few Herons there nesting every year, but that during the last two or three years their numbers had increased considerably, and he thought that now there were between thirty and forty pairs nesting there. All the nests that I could see were on the tops of thick fir trees. This heronry at Halsewell was not mentioned by Mr. Harting in his list of British Heronries in 'The Zoologist' for 1872, or in any of the additions subsequently made to that list; nor was it mentioned by myself in 'The Birds of Somerset.' I only knew of two at that time, which were included in Mr. Harting's list, namely, one at Picton in the west, and another at Brockley Woods in the east of the county,—to which Mr. Harting added a third, namely, that at Knowle House, near Dunster. I think it, therefore, worth while to mention this one at Halsewell, as it makes four well-established heronries in this county.—CECIL SMITH (Bishop's Lydeard).

[On the subject of this heronry Mr. W. Taylor, of Edgbaston, writing on the 20th March last, states, on the authority of Mr. E. Barham, who resides in Somersetshire, that "the heronry at Halsewell, which was set going about twelve years ago by an enterprising pair of Herons, numbers this year some fifty nests. Mr. Barham's late bailiff was there during the second week of March, and counted more than sixty birds sitting on the tops of the trees.—ED.]

**Occurrence of the Pine Grosbeak in Cambridgeshire.**—I am glad to be able to forward details of the capture of a Pine Grosbeak, which has, I believe, not been previously recorded. The bird was shot by one Robert Scotcher, groom to the Rev. A. H. D. Hutton, of Little Abington Vicarage, Cambs., in that gentleman's grounds, on the 13th of January, 1882, after having been seen, unaccompanied by any other bird, on several occasions in the covers around Abington Hall. Scotcher, not knowing what kind of a bird it was, sent it to an amateur in the village for preservation, but after having being wretchedly stuffed, and nearly spoiled by mice which were allowed to eat its legs and tail, it was sent to Travis, of Saffron Walden, who repaired the mischief. In the end Mr. Hutton

presented it to the Museum in this town, where it now is. Mr. Hutton, who has kindly supplied me with information, says that when shot it was feeding on the branches of a spruce fir, and that it proved to be a female, although from the plumage one would have supposed it a male. The following is a brief description:—Crown, cheeks, nape, whole of back and upper tail coverts had the feathers blackish grey, all being broadly edged with red, which showed a little mostly on the back, but not on the head or neck. The red was of a peculiar tint (certainly not "vermilion red," as described by Yarrell, and as on some other specimens with which I have compared it), which may, perhaps, be best described as red strongly tinged with crimson-lake. Tail-feathers blackish brown, faintly edged with red. Wing-coverts as tail, each feather tipped with white strongly tinged with red, thus forming two bars. Quill-feathers as tail. Outer edge of primaries margined with red. Breast, throat, and sides much the same as back, but with one or two yellowish feathers intermixed low down. Belly and under tail-coverts greyish, edges lighter.—ROBERT MILLER CHRISTY (Saffron Walden).

**Nesting of the Marsh and Reed Warblers.**—As doubts have been expressed with regard to the breeding of the former of these birds in this country, it may interest some of your readers to know that in the middle of July, 1880, I found a nest containing four eggs, somewhat incubated. The nest was attached to stems of *Scrophularia aquatica* and the common nettle, and was situated a few feet from the bank of a brook near Bath, Somersetshire. As one or two notices of the nest of this bird, taken near Taunton, have been recorded in 'The Zoologist' (1882, pp. 265, 306), I infer that it breeds annually in Somerset. The eggs are not to be mistaken for those of the Reed Warbler. I have compared them with a series of more than forty of the latter, and find they more resemble in colouring those of the Great Reed Warbler. I believe it is not generally known that the Reed Warbler is exceedingly plentiful along the course of the Bristol Avon, especially near Bath. In the months of June and July, 1881, I found 24 nests, containing altogether 46 eggs, not including young ones. They were all built on osiers except two, one of which was in a currant bush, the other in a willow tree. In one osier bed were eight nests. I have also found the bird to be common in the summer of 1882 in some marshes about eight miles from Cardiff, South Wales. There are numbers frequenting some large reed beds.—C. YOUNG (Llandaff).

**Bitterns Migrating in a Flock.**—On Dec. 15th last, when steaming from Alexandria to Cairo about sunset, a flock of forty or fifty large birds appeared slowly flapping towards us. When a long way off I at first mistook them for Lapwings, but as they passed close over us I saw they were Bitterns, the common *Botaurus stellaris*. I never before saw so many

together, but there was no doubt whatever about the species. They flew in a V formation, but every now and then got into great confusion, as if they had suddenly been fired at.—H. R. KELHAM (Captain 74th Regiment).

[This observation of the migration of Bitterns in a flock is extremely interesting, and we have not been able to find any similar record relating to this species. Sportsmen in England when out snipe-shooting have often come across a number of Bitterns scattered about over the marsh, and suggesting the probability of the arrival over night and gradual dispersal of a flock of these birds, but we believe that no actual observation of a flock *en route* as seen by Captain Kelham has hitherto been reported.—ED.]

**Choughs in the South of Ireland.**—Since October last I have seen two pairs of Choughs, *Pyrrhocorax graculus*, about the cliffs at the mouth of Glandore Harbour. On the 10th April I saw a pair, which were very noisy, wheeling about over my head. They must have had their nests somewhere near. I often see them going and coming to and from their feeding-grounds. They seem to go a considerable distance inland. I once saw a pair about four miles from the sea.—C. DONOVAN, JUN. (Myross Wood, Leap, Co. Cork).

**A Blind House Martin on the Wing.**—Late in the summer of 1879, while watching the flight of some of these birds at Mytton, in Shropshire, I observed one of them repeatedly fly very close to where I was sitting. It was much slower and more deliberate in its movements than its companions, and I succeeded without difficulty in catching it. On examination I found that it was blind, the balls of both eyes being absent. I placed it on the back of my chair, where it remained for some time. It then flew away and resumed its local flight. During the time it was at rest on its perch I observed that it turned, or rather twisted, its head as if in the act of listening. Its flight also was much lower than that of its companions, and it was curious to notice how it avoided coming in contact with the branches of the trees through which it constantly flew.—G. GYLES (Kilmurry House, near Waterford).

[We remember to have heard some years ago of a wild duck being shot which on examination proved to be completely blind—a case, it was believed, of congenital blindness. The sense of hearing, in both these cases, must have been intensified to such an extent that the birds were guided entirely by the notes of their companions. But how they contrived to avoid coming in contact with intervening obstacles is marvellous.—ED.]

**Fire-crested Wren at Oxford.**—As I believe that examples of this bird have hitherto been recorded as occurring in the summer and autumn only, I may mention that on February 16th, of this year, I observed one in the Botanical Gardens here. It was twisting about in a yew tree, and



I watched it carefully. The white line about the eye is a surer guide to identity than the crest.—A. B. R. BATTYE (Oxford).

[The first recorded British specimen of this bird was obtained near Cambridge in the month of August, 1832. With the exception of one other, procured in East Lothian, this is believed to be the only one procured here in summer; all others, according to Prof. Newton (4th ed. Yarrell, i. p. 457), having occurred between September and April, but mostly in the depth of winter.—ED.]

**Rookeries in London.**—In 'The Zoologist' for 1878 (pp. 193—199), Dr. Hamilton gave a report on this subject, supplemented by Prof. Newton (pp. 441—444), and additional notes were contributed subsequently (1879, p. 268; 1880, pp. 143, 515), in which the unwillingness of Rooks to leave the metropolis was clearly shown. It is interesting to observe that since the destruction of several large rookeries, notably those in Kensington Gardens and behind Hereford Square, small parties of the birds have established themselves in many new places. For instance, this spring four nests have been built in the three elm-trees on the south side of Kilburn Square, where no Rooks were, I believe, ever known to have built before. Other new sites have been, I understand, occupied at Barnes and even in Kensington; doubtless some of your readers can make the record of London rookeries complete to the present date.—H. T. WHARTON (39, St. George's Road, Kilburn, N.W.)

**The Birds of Lambay Island.**—A visit to Lambay on the 19th of March last yielded the following observations:—The Peregrine Falcon was busy about its breeding place, no eggs being yet laid, nor nest made apparently, but with that they sometimes dispense entirely. A Raven's nest contained three eggs, one rotten and two on the point of being hatched. The nest, large and cumbrously made outside, was neatly and comfortably lined with sheeps'-wool, horse-hair, and moss. With regard to the Hooded Crow, I should mention that it occurs sometimes at Howth, and is commoner than I supposed at Wicklow, where Mr. Barrington finds it breeding. It is, however, a decreasing species, and rarely seen near Dublin. The Rooks were laying, and settling their nests. I accidentally omitted mention of the rookery at the Castle. I was informed by the lads on the island that a pair of Magpies usually breed on Lambay. I was much interested to see that the Puffins had arrived. They had been there for a few days, and were no doubt cleaning out their burrows. This bird appears to be about the earliest summer migrant to arrive in Ireland; it was certainly the earliest this year in Co. Dublin. The only other birds on the cliffs were the Cormorants; they were, I believe, breeding in holes in the rocks, in quite inaccessible situations. The Cormorant remains on the island through the winter, roosting in these holes. No Gulls were seen, but a pair of Manx Shearwaters were observed between Rush and Lambay, about a mile and a half

from the island. Through an unfortunate oversight, the names of the Swallow and the House Martin were omitted from the above list. Both these birds breed on the island, the former about the castle, and the latter on the north-eastern and eastern cliffs. I have never seen Swifts on Lambay.—H. C. HART (14, Lower Pembroke Street, Dublin).

#### REPTILES.

**The Palmated Newt in Gloucestershire.**—Desiring to procure some examples for Mr. Rope and Mr. Aplin, I recently wrote to a correspondent, Mr. Witchell, of Stroud, by whom I had been favoured with examples in 1881. I asked Mr. Witchell to give some account of its habits in his district, and believe that the following remarks, extracted from his reply, may prove of general interest. He says:—"I first observed the Palmated Newt in the neighbourhood of Stroud in 1873, in some pools near the Stroud Reservoir. They are there common, and keep down the insects. I have noticed that where there are many Palmated Newts there are few Smooth or Common Newts. I have found the former (really the common Newts here) in all the pools on the Cotteswold Hills surrounding this town, and in some of them they are very plentiful. In one pool in a brickyard also I found immense numbers; and a small boy, whom I asked to procure me some, brought a bucket-full of them to our house the same evening. Whether the Palmated Newt destroys the tadpoles of the Common Newt, I cannot say, but I am certain that, in any pool near Stroud, you would find twenty Palmated Newts for one Smooth one. I may add that the Palmated Newt leaves its winter quarters earlier than the other two species, many being killed by the occasional early frosts, when the ponds are frozen over. They retire also for the winter later than the other Newts. The tadpoles of the Palmated Newt are often devoured by the tadpoles of the Great Water Newt, even when almost ready to leave the water." To the foregoing it may be worth while adding the following points:—1. A pair of Palmated Newts which Mr. Witchell gave me in 1881 showed a strong predilection for the tadpoles (or "Polheudes") of the Common Frog. 2. The fine filament at the end of the male's tail did not become absorbed during the following winter, as Dr. Cooke states is usually the case ('Our Reptiles,' p. 168). 3. My examples were very late in hybernating, and seemed to bear cold better than the Smooth Newt.—H. A. MACPHERSON.

#### BATRACHIANS.

**The Edible Frog in Suffolk.**—In connection with recent remarks on Batrachians (pp. 84, 129, 130) it may be of interest to note that in August of last year a specimen of *Rana esculenta* was found in the garden of the house at which I was then staying at Felixstowe, in Suffolk. I kept it for two days under a flower-pot, and then it escaped. I have now no books by me to which to refer, but I believe that some exist, or formerly existed, at

Thetford. I do not think, however, that they were asserted to be indigenous there. Understanding from Dr. Taylor, of the Ipswich Museum, that he had found the Natterjack at Bawdsey, I spent some hours there upon a careful search for examples, but without success; and I have reason to believe, from the reports of others, that the Bawdsey colony is now extinct.—A. B. R. BATTYE (Oxford).

[The colony of *Rana esculenta* near Thetford was discovered thirty years ago (1853) by Prof. Newton, whose account, originally published in 'The Zoologist,' will be found reprinted in Cooke's 'Our Reptiles,' p. 102.—ED.]

## FISHES.

**Occurrence of the Wolf-fish in Devonshire.**—A fisherman brought me a specimen of the Wolf-fish (*Anarrhichas lupus*, L.) taken at Teignmouth in a herring-net on the 20th March last. Its total length was 3 ft. 5¼ in. Width at the commencement of the dorsal fin, 11½ in.; width at centre of abdomen, 10½ in.; width just behind the vent, 8 in. Colour almost uniform grey, the black bands only faintly visible. The anal aperture was remarkably large and conspicuous. The stomach contained the remains of eight large Whelks (*Buccinum undatum*), recently swallowed, the opercula being still attached to the muscular feet, but there were only a few fragments of the shells, showing that the fish must somehow get rid of most of the shells after crushing them, retaining the animals. Besides the formidable array of teeth in the jaws and palate, there were three rows or groups of teeth on the lower pharyngeal bone, a fact not mentioned by Gunther, Yarrell, Couch, or Day. I found three specimens of a remarkable *Lernean* on the gills, but unfortunately lost one; the other two I put into spirits. There was very little smell from the flesh, except the large cheek-muscles, which had a peculiar rank scent. A person who ate some of the flesh, after being cooked, pronounced it very good. Couch mentions one specimen taken off Plymouth, and that is, I believe, the only previously-recorded specimen which has occurred on the coast of Devon. The figure in Yarrell's 'British Fishes' appears to have been drawn from the imagination of the artist. Dr. Day's illustration of this species in his 'Fishes of Great Britain and Ireland' is not so good as the others in that admirable work, and does not look as if it had been taken from a recent specimen, the front teeth being too conspicuous, and placed too vertically instead of the lower ones projecting almost horizontally from the jaw, and their shape is different from those in my specimen. The dorsal fin comes a little too far towards the head, and there is a point on the gill-covers not to be seen in the present individual, but the shape of the head is represented more correctly than in Couch's figure in his 'Fishes of the British Islands,' which, however, shows the form of the body the best. There are no "regular furrows diverging from the eye," as mentioned by Couch, and shown in his figure. The specimen has been

preserved for this museum.—W. S. M. D'URBAN (Albert Memorial Museum, Exeter).

**Occurrence of the Lump-sucker in Devonshire.**—On the 3rd April a specimen of the Lump-sucker was captured at Exmouth, having followed a crab-pot which was being hauled up. It is the largest I have ever received from this coast, being 1 ft. 9 $\frac{1}{4}$  in. in length, and 10 in. in width at the pectoral fins. It was a female, like most of those taken near the shore in spring, and was of a deep bluish black colour, marked with greyish white. There were a great many specimens of a small *caligus* on the skin. There was nothing but mucus in the stomach. The roe was not developed. Some of the fin-rays were curiously enlarged, and on the upper angle of the caudal fin was a bony excrescence. It is stated that there are no teeth on the tongue, but in this specimen there is a group of strong teeth in the centre of the lower part of the mouth. This fish is not very common on this coast. Very small ones are sometimes obtained in the estuary of the Exe. It appears to be more numerous in deep water off Plymouth, but at Exmouth, Teignmouth, and Brixham it is looked upon as a great rarity by the fishermen.—W. S. M. D'URBAN (Albert Memorial Museum, Exeter).

**The "White Trout" of Pennant.**—The Rev. H. M. St. Aubyn, of Clowance, some time since informed me that he had, in his ponds there, Common Trout and another and different fish of the Trout family, which, as a rule, occupied different sides of the pond. He has kindly sent to me recently a specimen of the latter fish, and on examination I found it, beyond all question, to be the "White Trout" of Pennant—the fish which Jenyns doubted might be the young of *Salmo trutta* (the Sea Trout or Salmon Trout), in which doubt Yarrell acquiesces with, apparently, a reservation that he wanted proof of its occurrence in waters entirely disconnected with the sea before he declared it a separate species. It is also the *Salmo trutta*, var. *albus* of Day, who does not declare it to be exclusively a fresh-water fish. Clowance ponds are fed by a rivulet rising in granite hills, a few miles above them, and about half a mile below the ponds water charged with mineral refuse begins to flow into this rivulet, increasing in quantity from the various mines on the banks, until, some six or eight miles down, it falls into the sea in the Hayle Estuary. This pollution has been going on for at least a century, and in the polluted waters no fish, not even eels, can live. So that here we have a fish, identical in every way except in size with *Salmo trutta*, spending its whole existence, and breeding freely, in fresh water. I think this shows that *Salmo trutta*, var. *albus*, may be a purely fresh-water member of the Salmon family.—T. CORNISH (Penzance).

#### ARCHÆOLOGY.

**Origin of the Name "Daker-hen."**—In Lincolnshire there is a common provincial term in use expressive of unsteadiness or uncertainty in gait, whether in bipeds or quadrupeds. Country people say he "dackers"



in his walk, or "I see'd him a-coming, but he 'dackered' a good bit as he came along," that is, advanced in an uncertain and hesitating manner. Speaking of a horse in a steeplechase, "he 'dackered' at his fence, and down he came." May not the word "daker," as applied to the Corn Crake, be a corruption, or another form, of this provincialism having reference to its apparent uncertain advance, as expressed in the ventriloquous call-notes, now here, now there, sometimes close to the listener, and then again at a distance? So that in time country folks, always quick and ready enough to note any peculiarity in the animal-life around them, would know it as the "dacker" or "daker-hen," the bird which "dackers" in its walk or advance.—JOHN CORDEAUX (Great Cotes, Ulceby).

[The verb "to dacker," with the signification "to waver, stagger, or totter," is given in Ray's 'Collection of North-Country Words,' where it is especially referred to as in use in Lincolnshire. Jamieson also, in his 'Scottish Dictionary,' gives the verb "to daker" or "daiker" as in use in Scotland. We scarcely think, however, that this offers the right explanation of the name "Daker-hen." A more probable origin, as recently suggested to us, is the Scandinavian *Ager h  ne*, i. e., "field-hen," it being in accordance with rule that the "g" of the one language should become the "k" of the other. The initial "D," difficult otherwise to be accounted for, is doubtless a corruption of "T," an abbreviation of "the." In the North of England we often hear the expression "t'ould man" for "the old man"; and thus we have "t'acre hen" for "the acre hen."—ED.]

## SCIENTIFIC SOCIETIES.

### LINNEAN SOCIETY OF LONDON.

March 18, 1883.—FRANK CRISP, LL.B., Treasurer and Vice-President, in the chair.

Professor T. S. Cobbold read a paper on *Simondsia paradoxa* and its probable affinity with *Spharularia bombi*. Thirty years ago Professor Simonds discovered a remarkable parasite within cysts in the stomach of a Wild Boar which died in the Zoological Gardens, London. This he regarded as a species of *Strongylus*, but Dr. Cobbold, in 1864, suggested its affinity with the genus *Spiroptera*, and named it *Simondsia*. The original drawings were unfortunately for a time mislaid, and have only lately been found along with the specimens, enabling Dr. Cobbold to investigate them more closely. He has now arrived at the conclusion that *Simondsia* is a genus of endoparasitic nematodes, in which the female is encysted, and furnished with an external and much-enlarged uterus, whose walls expand into branches terminating in cæca. The male is half an inch, and the female six-tenths of an inch in length. It now appears that what was at first mistaken for the head is in fact the tail, so that the supposed

strongyloid character disappears. Taking into account what is known of *Sphærulearia bombi*, as interpreted by Schneider, whose views are universally accepted, it appears that *Simondsia*, though unique, yet approaches *Sphærulearia* in the character of the female reproductive organs. Until Sir J. Lubbock's memoir on *Sphærulearia* appeared, the so-called male had never been indicated; but judged by Schneider's interpretation of that genus the male is still unknown. Dr. Cobbold points out that the so-called rosette in *Simondsia* is morphologically a prolapsed uterus furnished with two egg-containing branches—he regards the external branched processes as homologous with the sphærules of *Sphærulearia*, whilst the ultimate cæcal capsules have nothing comparable to them in nature. Dr. Cobbold describes all the peculiarities of this strange worm in detail, and gives a diagnosis of the genus and species.

A paper was read "On the Moths of the family Urapterygidæ in the collection of the British Museum," by Arthur G. Butler. The family of Geometrites, founded by Guénée under this name, can only arbitrarily be separated from the Eunomidæ. Dr. Packard says—"The fact that genera so closely allied as *Drepanodes* and *Entrapela* are placed separately in the families Eunomidæ and Urapterygidæ by M. Guénée seems to me a proof that the groups are artificial ones, and should be united." In the generic division of the Geometrites, although neuration (as throughout the Lepidoptera) must be considered of the highest importance, it is nevertheless impossible to ignore the characters offered by the different forms of the wings, each accurately repeated in series of allied species. Guénée, although evidently regarding structure as correlated with pattern and coloration, nevertheless gave one plate, chiefly of neuration as illustrative of the tribe. The absurdity of the number system, however, and one that from Mr. Butler's inability to believe it a fact, rendered the generic descriptions of continental writers unintelligible to him for many years, lies in the truth that it is essentially a retrograde movement. The author refers to Von Heinemann's 'Schmetterlinge Deutschlands' (p. 6), where it will be seen that the veins are positively numbered from the back forwards, from the inner to the front margin. What Butler calls the front legs are their hind legs, and the club of the antenna, where it exists, must be the last thing to describe. In speaking of a branched vein like the median it is in accordance with common sense to call the first branch emitted the first and not the third; therefore in this vein the branches in this vein have to be counted upwards, but this is no excuse for counting the last emitted branch of the subcostal vein as first. Therefore Mr. Butler says that the number system, although easy to learn, is unreasonable, and (excepting in the case of very careful observers) worse than useless." The following new genera are indicated:—*Tristrophis*, *Gonorthus*, *Sermopteris*, *Nepheloleuca*, *Thinopteryx*, *Xeropteryx*, and *Eschropteryx*.

The 18th contribution to the Mollusca of the 'Challenger' Expedition, by the Rev. R. Boog Watson, was read, in which the author treats of the family *Tornatellidae*, therein describing six new species of the genus *Actæon*.

April 5.—Sir JOHN KIRK, K.C.M.G., Vice-President, in the chair.

Messrs. R. M. Barrington, G. E. Comerford-Casey, F. V. Dickins, and E. Cambridge Phillips were elected Fellows of the Society.

There was exhibited for Mr. R. Morton Middleton a well-marked example of wood showing the extensive ravages of the Isopod *Limnoria lignorum*. The wood was from the pier-piles of West Hartlepool, where the said crustacean's depredations are very destructive.

Mr. F. W. Phillips read a communication in which he described a new species of fresh-water Infusorian allied to the genus *Gerda*, and which provisionally is named *G. caudata*.

Other papers read related solely to botanical subjects.—J. MURIE.

#### ZOOLOGICAL SOCIETY OF LONDON.

March 20, 1883.—Prof. W. H. FLOWER, I.L.D., F.R.S., President, in the chair.

Mr. Selater called attention to the fact that a living specimen of *Macropus erubescens* (a species originally described from a single specimen living in the Society's Gardens) was in the Gardens of the Zoological and Acclimatisation Society of Melbourne.

Mr. Selater laid before the meeting a set of the sheets of a new List of British Birds, which had been prepared by a Committee of the British Ornithologists' Union, and would shortly be published, and explained the principles upon which it had been constructed.

Prof. Huxley read a paper on the oviduct of the Common Smelt, *Osmerus eperlanus*, and took occasion to remark on the relations of the Teleostean with the Ganoid Fishes. Prof. Huxley came to the conclusion that the proposal to separate the Elasmobranchs, Ganoids, and Dipnoans into a group, apart from and equivalent to the Teleosteans, was inconsistent with the plainest anatomical relations of these fishes.

Mr. G. A. Boulenger read a paper containing the description of a new species of Batrachian of the genus *Bufo* obtained at Yokohama, Japan, during the Expedition of H.M.S. 'Challenger.' The author proposed to describe it as *Bufo formosus*.

A communication was read by Mr. W. N. Parker containing some notes on the respiratory organs of *Rhea macrorhyncha*, and comparing these organs with those of the Apteryx and Duck.

April 3, 1883.—St. G. MIVART, F.R.S., Vice-President, in the chair.

The Secretary read some extracts from a letter he had received from Mr. J. Sarbo in reference to the Gayal. The writer observed that *Bos*

*gaurus* (the Gaur), and not *Bos frontalis* (the Gayal), is the Wild Ox of Assam, and that *B. frontalis* is not known in a wild state, but only as a semi-domesticated animal owned by various wild tribes from Assam to Arracan.

Mr. Sclater called the attention of the meeting to the skin of a Brown Crow from Australia, which had been sent to him for examination by Mr. Albert A. C. Le Souef, and which he was inclined to regard as a variety in plumage of *Corvus australis*.

Mr. A. G. Butler read a paper containing an account of a collection of Indian Lepidoptera made by Lieut.-Colonel Charles Swinhoe, chiefly at Kurrachee, Solun and Mhow. Thirty-two new species were described, and numerous field-notes by Col. Swinhoe were incorporated in the paper.

Col. J. A. Grant read some notes on the Zebra met with by the Speke and Grant Expedition in the interior of Central Africa in 1860-63, which certainly belonged either to the true Zebra, *Equus zebra*, or to its closely-allied northern form, the recently-described *Equus Grevyi*.

April 17, 1883.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of March, and called special attention to the three Sirens, *Siren lacertina*, from South Carolina, presented by Dr. G. E. Manigault; and to an American Teetee Monkey of the genus *Callithrix*, which it was difficult to determine satisfactorily in its living state, but which was certainly new to the Society's Collection.

Prof. Flower gave an exposition of the systematic classification of the Mammalia, which he had recently prepared for use in arranging the specimens in the Museum of the College of Surgeons, and in a treatise on the subject of Mammals in the 'Encyclopædia Britannica.'

A communication was read from Mr. W. L. Distant, containing the first of a series of contributions to an intended monograph of the Homopterous family *Cicadidæ*. In the present paper the author gave the results of an examination of the *Cicadidæ* contained in the Dresden Museum (including the specimens collected in Celebes by Dr. A. B. Meyer), and added the descriptions of other species belonging to the collections of Dr. Signoret and the author. Eleven species were described as new from various localities.

Mr. Sclater read a second paper on the birds collected in the Timor Laut or Tenimber group of islands by Mr. H. O. Forbes, based on additional specimens lately received. The avifauna of the group, as indicated by Mr. Forbes's collection, contained fifty-nine species, of which twenty-two were peculiar to these islands.

A communication was read from Mr. F. Moore, containing the first part of a monograph of the Butterflies belonging to the groups *Limnaina* and *Euplaeina*.—P. L. SCLATER, Secretary.

